

70255
Ilmenite Basalt
277.2 grams

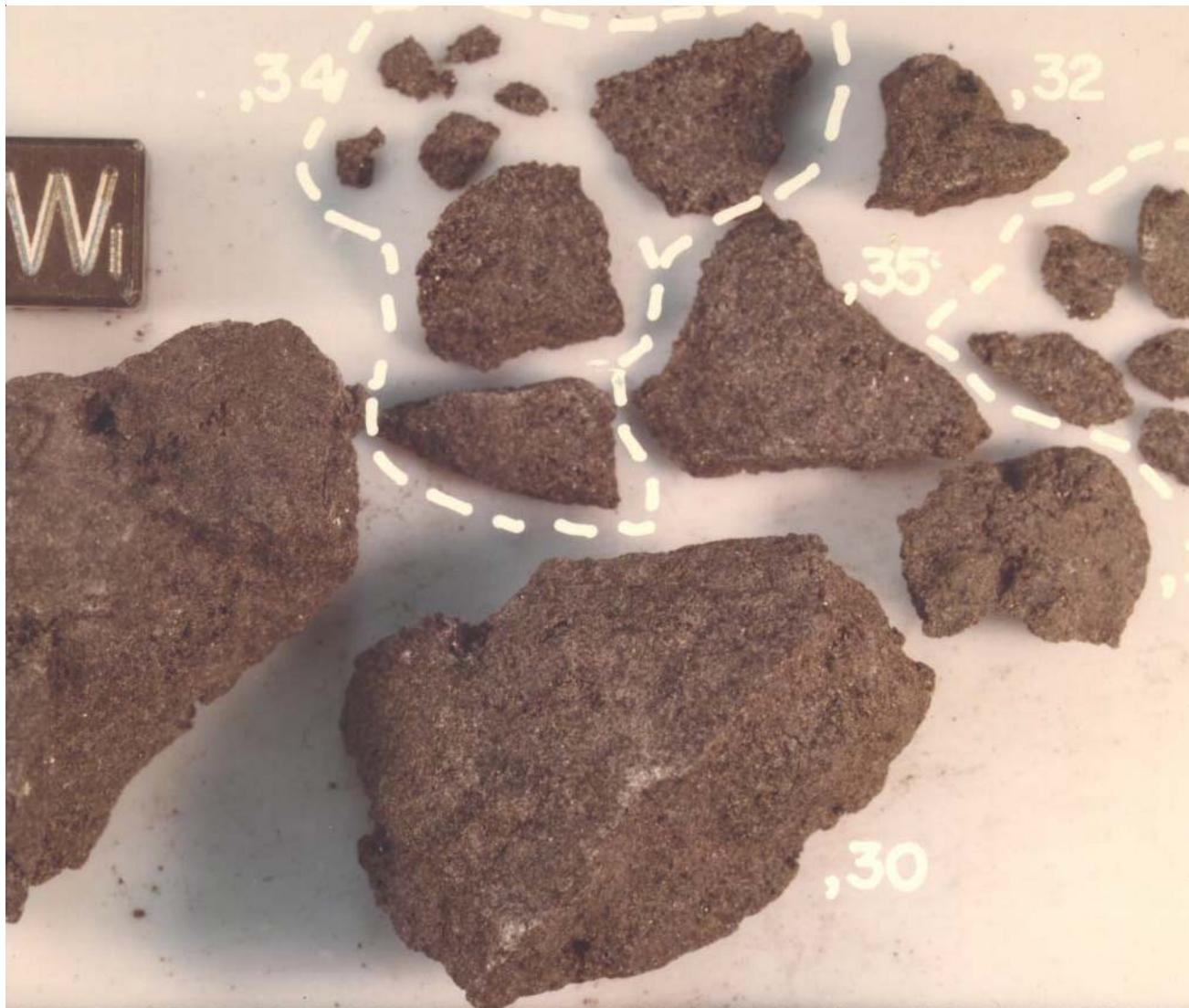


Figure 1: Color photo of fine-grained basalt 70255. Cube is 1 cm. NASA S75-24191.

Introduction

70255 is a fine-grained Ti-rich basalt. It was collected from the ALSEP site, near the LM.

70255 is an oriented sample, because half is angular and free of zap pits, while the other half is rounded with numerous zap pits.

Petrography

Neal and Taylor (1993) reviewed the information on 70255. It is a blocky, subangular, homogeneous basalt with 1-2 % vugs. It contains both olivine and silica as

Mineralogical Mode of 70255

Brown et al. 1975	
Olivine	5 vol. %
Pyroxene	47.7
Plagioclase	14.8
Opaques	30.9
Silica	1.6

a consequence of rapid crystallization. Usselman et al. (1975) calculated the cooling rate is 2 – 5 deg/hr.

Chemistry

Warner et al. (1975a) and Rhodes et al. (1976) determined the chemical composition (table 1). Keith et al. (1974) determined K, U and Th by radiation counting. Lindstrom and Haskin (1978) find it is a type A.

Radiogenic age dating

Nyquist et al. (1976) determined Rb, Sr and $^{87}\text{Sr}/^{86}\text{Sr}$ for whole rock, but didn't report an age.

Schaeffer and Schaeffer (1977) determined an old age – older than other A17 samples (figure 5). Paces et al. (1991) listed it as type A (perhaps similar to 70215).

Cosmogenic isotopes and exposure ages

Keith et al. (1974) determined the cosmic ray induced activity of 70255 as $^{26}\text{Al} = 49 \text{ dpm/kg.}$, $^{22}\text{Na} = 72 \text{ dpm/kg.}$, $^{54}\text{Mn} = 137 \text{ dpm/kg.}$, $^{56}\text{Co} = 211 \text{ dpm/kg.}$ and $^{46}\text{Sc} = 63 \text{ dpm/kg.}$

List of Photo #'s for 70255

S73-21974 orientation

S73-24191 processing

S73-16042 – 049 color

S73-24088 – 24103 B&W

S76-21639

S76-21643

S76-21650

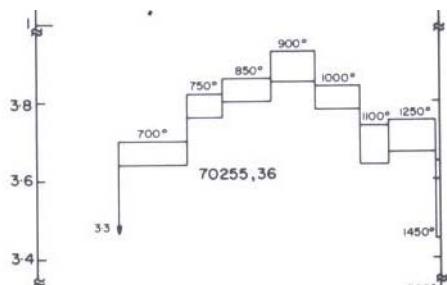


Figure 5: Ar - Ar plateau for 70255 by Schaeffer and Schaeffer 1976.

Summary of Age Data for 70255

Schaeffer and Schaeffer 1977	$\text{Ar/Ar} = 3.84 \pm 0.02 \text{ b.y.}$
Note: Old decay constant	

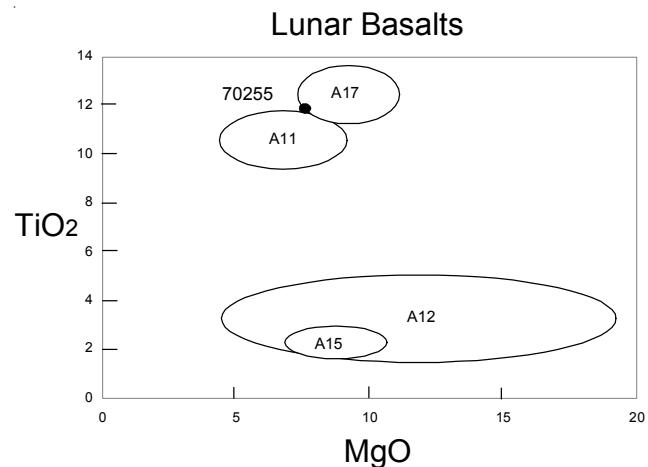


Figure 2: Composition of Apollo basalts with 70255.

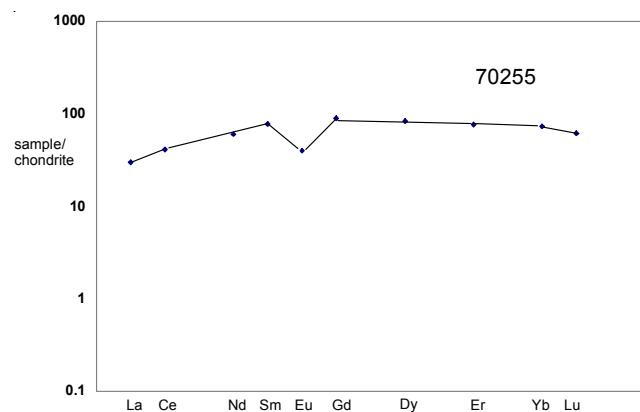


Figure 3: Normalized rare-earth-element diagram for 70255 (data from Rhodes et al. 1976).

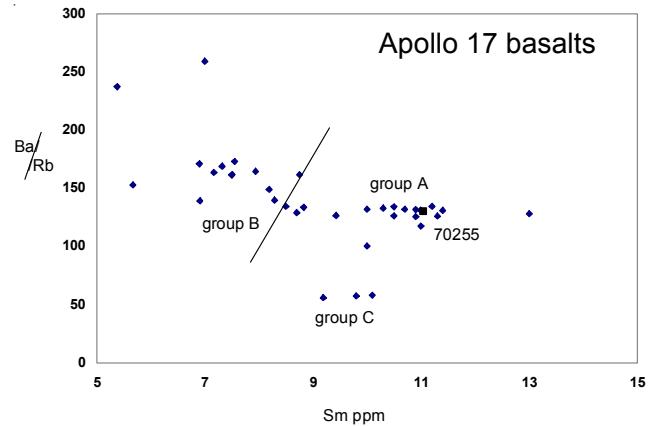


Figure 4: Trace element plot of Apollo 17 basalts showing 70255 is type A.

Table 1. Chemical composition of 70255

reference weight	Rhodes76	Keith 74	Warner75 Hughes85
SiO ₂ %	40.11	(a)	
TiO ₂	11.41	(a)	11.3 (b)
Al ₂ O ₃	9.02	(a)	9.1 (b)
FeO	18.73	(a)	20.3 (b)
MnO	0.29	(a)	0.249 (b)
MgO	7.63	(a)	8 (b)
CaO	11.3	(a)	10.6 (b)
Na ₂ O	0.39	(a)	0.387 (b)
K ₂ O	0.05	(a) 0.048	(d) 0.077 (b)
P ₂ O ₅	0.04	(a)	
S %	0.19	(a)	
<i>sum</i>			
Sc ppm	80	(b)	90 (b)
V			76 (b)
Cr	2860	(b)	
Co	17.5	(b)	19.5 (b)
Ni			
Cu			
Zn			
Ga			
Ge ppb			
As			
Se			
Rb	0.65	(c)	
Sr	199	(c)	
Y			
Zr			276 (e)
Nb			
Mo			
Ru			
Rh			
Pd ppb			
Ag ppb			
Cd ppb			
In ppb			
Sn ppb			
Sb ppb			
Te ppb			
Cs ppm			
Ba	85.3	(c)	
La	7.05	(c)	6.4 (b)
Ce	24.7	(c)	
Pr			
Nd	27.3	(c)	
Sm	11.4	(c)	10 (b)
Eu	2.23	(c)	2.2 (b)
Gd	17.6	(c)	
Tb			
Dy	20.2	(c)	18 (b)
Ho			
Er	12.1	(c)	
Tm			
Yb	11.8	(c)	10 (b)
Lu	1.48	(c)	1.4 (b)
Hf	9.7	(b)	9.6 (e)
Ta			
W ppb			
Re ppb			
Os ppb			
Ir ppb			
Pt ppb			
Au ppb			
Th ppm		0.31	(d)
U ppm		0.107	(d)

technique (a) XRF, (b) INAA, (c) IDMS, (d) radiation counting

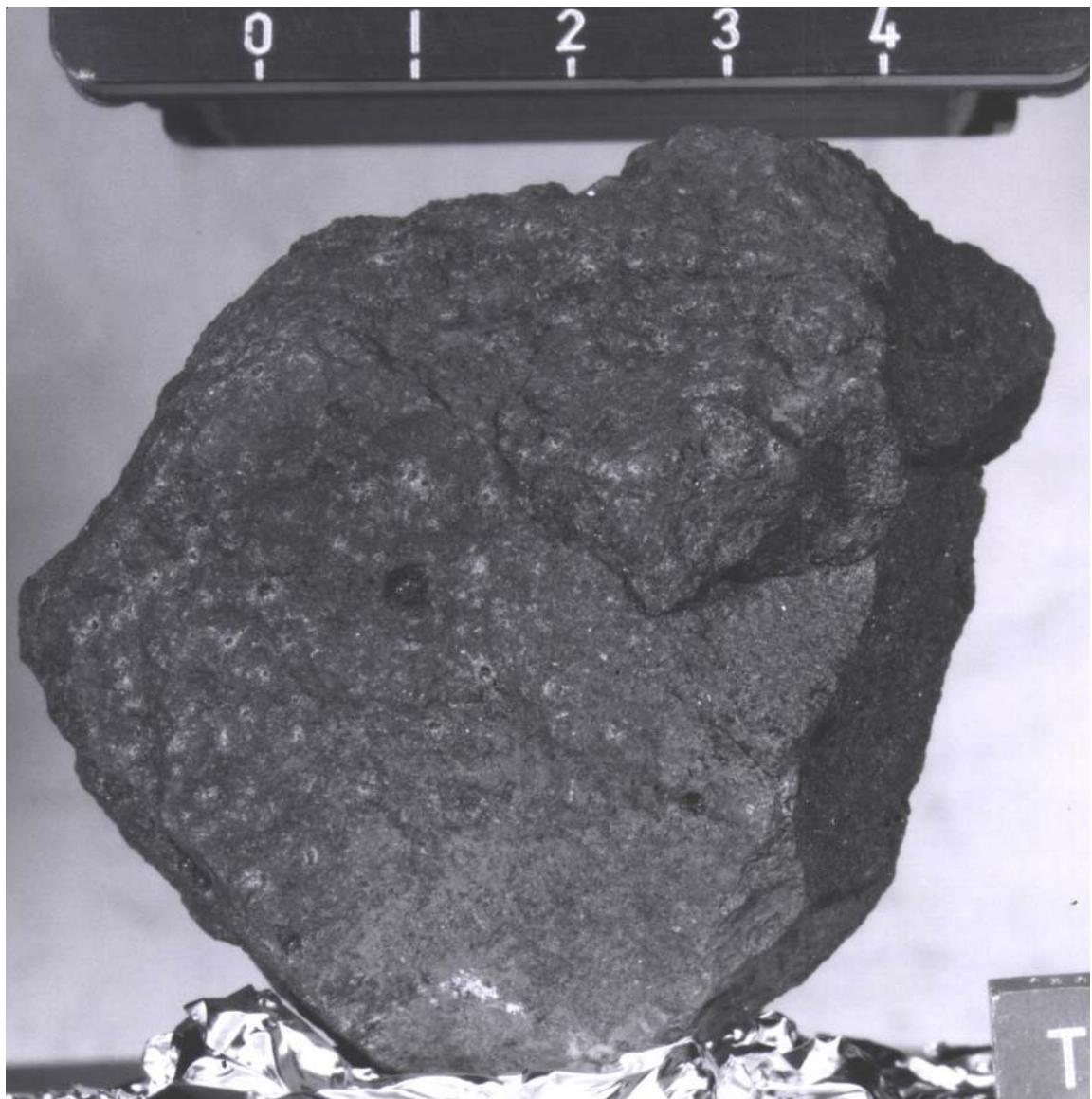
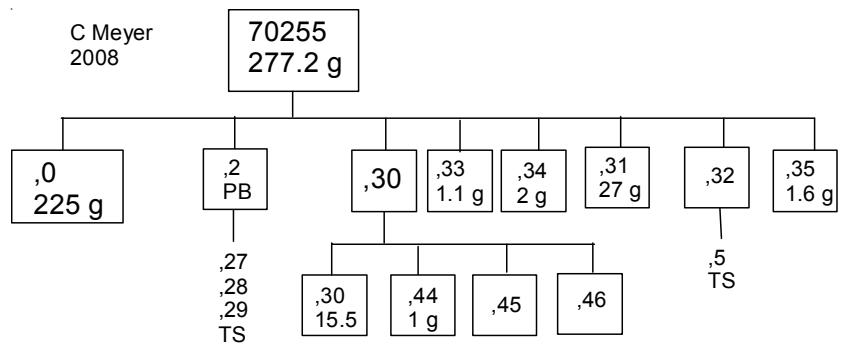


Figure 6: Original photo of 70255 showing large micrometeorite crater. Scale is in cm.
NASA S73-24101.

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